REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Claims 4-24 are pending in the application. Claims 4, 11, and 18 are independent. new claims 25-30 have been added.

The independent claims have been amended to clarify that embodiments of the Applicants' system and method are to be applied only to risk management systems in which simulations are performed under a plurality of future scenarios at a plurality of future time steps, each of the possible future scenarios having associated therewith a probability of the scenario occurring (see e.g. Applicant's description, p. 1 lines 18-19).

The independent claims have also been amended to clarify that the changes made to the simulated dynamic portfolio by evaluating at least one rule for a trading strategy at each of a plurality of possible future scenarios at a plurality of future time steps is dependent not only on the value of at least one tracking attribute at the current time step but also on the respective possible future scenario (see e.g. Applicant's description, p. 4 line 13, p. 4 lines 26-29, p. 6 line 35 to p. 7 line 2, p. 7 lines 17-20, p. 8 lines 21-22).

Claim 4 has been amended to clarify that the at least one rule for a trading strategy is defined in at least one trade manager, consistent with claims 11 and 18. New claims 25-30 have been added to cite specific structures of a trade manager and the funding position list thereof (see e.g. Applicant's description, p. 6 line 26 to p. 8 line 9, and p. 13 line 13 to p. 14 line 14). Minor amendments have also been made to some terms in the independent claims for consistency. No new matter has been added.

Accordingly, claims 4-30 remain in the application.

Claim Rejections – 35 U.S.C. 103

Claims 4-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,188,992 issued to French ("FRENCH") in view of U.S. Patent No. 5,729,700 issued to Melnikoff ("MELNIKOFF") and U.S. Patent No. 6,249,769 issued to Ruffin et al. ("RUFFIN"). The Applicants respectfully traverse all art rejections.

In the first instance, the Examiner suggests that all of the features of the independent claims are disclosed in FRENCH, with the exception of the step of producing an output risk metric that is disclosed in MELNIKOFF. We respectfully disagree. It will be clear to persons of ordinary skill in the art that FRENCH and MELNIKOFF, taken alone or in combination, do not disclose all of the claimed limitations. An understanding of the concept of a simulation in the context of the claimed subject matter is required.

Most risk management systems are configured to perform simulations. In accordance with one particular type of simulations that might be performed, changes to the composition of a simulated dynamic portfolio under a plurality of possible future scenarios at a plurality of future time steps are made, with each of the possible future scenarios having associated with it a probability of the scenario occurring. Accordingly, in the context of the risk management systems that are configured to perform this particular type of simulations, persons skilled in the art will understand that "simulation" refers to the projection of future states of the world based on today's data (e.g. current market rates, and current composition of a portfolio). This type of simulation involves scenarios defining possible market environments in the future (e.g. whether interest rates will rise in the future, whether GDP will fall, etc.). Each of these scenarios represents its

own market environment, and is weighed by a subjective probability of its occurrence. In view of the above characteristics, persons skilled in the art may characterize such simulations as "forward-looking", and it is respectfully submitted that these characteristics are reflected in the claims.

In known risk management systems where forward-looking simulations are performed, historically, users could only define limited portfolio evolution strategies. Certain assumptions would typically be made to minimize complexity and to facilitate more efficient computation.

For example, it might be assumed that cash from a bond coupon is always to be re-invested in a specific pre-selected instrument, such as a money market account or a similar bond for example (see e.g. paragraphs [0005] and [0007] of the Applicants' description). Composition of a simulated portfolio would then change in accordance with this assumption for all scenarios. Notably, the simulated portfolio would evolve in accordance with this assumption even under a given scenario where a user, in the real world, would not have acted in that way (e.g. in a particular scenario where the return provided by the pre-selected instrument is poor). In the real world, which the risk management system is trying to simulate, a user might instead have reinvested the cash in a more appropriate instrument, taking into account the market conditions and the instruments available at the simulated future point in time under that particular scenario (see e.g. paragraph [0006] of the Applicants' description).

Accordingly, when a simulation is performed under assumptions that are unrealistic for certain scenarios, the results produced by the known risk management system may be inaccurate.

In view of this, there arose a need to improve these particular risk management systems (i.e. risk management systems configured to perform

forward-looking simulations), so that the evolution of simulated portfolios could be more accurately modeled.

Persons skilled in the art will understand that the claimed subject matter does not encompass or pre-empt all systems where simulations are performed, nor does it encompass or pre-empt all systems where different trading strategies are evaluated. The Applicants' system and method are directed to a specific technique for defining a trading strategy in a risk management system where forward-looking simulations are performed. Generally, the user can define rules that are used to implement various trading strategies by which a simulated portfolio can change with time over possible future scenarios, and in response to risk factors or other attributes. In contrast, none of the cited references provide any guidance on how trading strategies might be accurately modeled for use in forward-looking simulations.

In particular, with respect to the claims, persons skilled in the art would understand that FRENCH, taken alone or in combination with any of the other cited references, does not disclose all of the recited features, which are associated with the specific technique for defining a trading strategy in forward-looking simulations taught by the Applicants in the present application. For example:

• FRENCH does not disclose a system that performs forward-looking simulations, where changes to a simulated portfolio are made "under a plurality of possible future scenarios at a plurality of future time steps" (claims 4, 11, 18). The type of "simulation" performed in FRENCH may be considered to involve the "morphing" of trading strategies based on historical data. In FRENCH, it is not the state of the world that is changing, but rather the trading strategies being tested, in a market environment that is static and represented only by current and historical data. A set of initial Agents with a set of morphing rules can be

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specified, and their performance tested across the historical data. The morphing rules can be adjusted to see which parameters work best on the historical data. While this might also be considered a "simulation" in general terms, persons skilled in the art would understand that it is distinguishable from the forward-looking simulations to which the Applicants' claimed subject matter applies. FRENCH explicitly states that its "computerized process adapts and refines its operation based on current market conditions and past performance of the agent..." (FRENCH, column 3, lines 16-20). This clearly teaches away from the claimed subject matter. Persons skilled in the art would understand that for risk management purposes, only systems that provide forward-looking simulation capability would be relevant.

- FRENCH does not teach the defining of rules that are "dependent on at least one tracking attribute, on at least one tracking position, and on at least one trade position", and where changes to the portfolio "are dependent on the value of said at least one tracking attribute at the current time step and on said... possible future scenario" (claims 4, 11, 18). The Examiner suggests at page lines 7-9 of the office action that the investment characteristics of each Agent constitute tracking positions and tracking attributes. We respectfully disagree. In the Applicants' system, the tracking positions and tracking attributes track various features of a simulated portfolio to determine how much to trade of the instruments in a list of trade positions. Furthermore, the Applicants' tracking attributes have values that are dependent on time step and future scenario, as claimed. It will be understood that one is not necessarily trading what one is tracking, and therefore, it is erroneous for the Examiner to conclude that the investment characteristics of each Agent contribute tracking positions and tracking attributes. Notably, FRENCH does not teach or suggest that its Agents may somehow be modified so that the Agents themselves can determine how much of an instrument to buy or sell based on various, dynamic, future time step dependent and scenario dependent criteria. For example, based on the

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teachings of FRENCH, it would be impossible for the person of ordinary skill in the art to arrive at a solution that models strategies such as: "Trade Option A to delta hedge my portfolio", "Trade Bond D to ensure a portfolio duration of 5" or "Liquidate some amount of Commodity G to ensure portfolio always has $5M in cash". In contrast, the claimed features of the Applicants' trade manager, which comprise at least one tracking attribute and on at least one tracking position, facilitate the modeling of such trading strategies in a risk management system where forward-looking simulations are performed. There are no equivalent components corresponding to the tracking positions and tracking attributes in the system described in FRENCH.

• FRENCH neither teaches nor suggests that its Agents may be configured to invoke "a risk engine in generating one or more simulated instruments not existing at the time said at least one simulation is executed by evaluating an instrument model that employs one or more of said risk factors, and adding said generated simulated instruments to the simulated dynamic portfolio in producing a changed simulated dynamic portfolio" (claims 4, 11, 18). Persons skilled in the art would understand that FRENCH assumes that all of the instruments representing potential investments exist when an Agent is invoked. In contrast, in the Applicants' claimed system and method, the value of an instrument that needs to be added to a portfolio in the future will be time and scenario dependent, and accordingly, such an instrument cannot be generated solely based on current market and historical data. As the simulations in FRENCH are not forward-looking, the need to generate such instruments would not have been recognized.

• FRENCH does not teach that each rule may be assigned a priority (claims 7, 14, 21), or that each rule is evaluated in order of priority when changes to the portfolio are simulated (claims 8, 15, 22). The Examiner suggests that rules "inherently are assigned priorities and evaluated in order of that priority",

with reference to Figure 4 of FRENCH, at page 3 of the office action. We respectfully disagree. FRENCH does not teach that the Agent can have different priorities or importance levels. Figure 3 clearly shows that each investment Agent is invoked sequentially (i.e. one after the other) on a first come, first served basis. The reason that trading priorities are neither required nor appropriate to the simulations of FRENCH is clear, particularly from the description of FRENCH at columns 4-5. Each Agent is assigned characteristics such that it is associated with separate and distinct investments in order to avoid conflicting strategies. The uniqueness of each Agent is ensured at the time of an Agent's creation (see Figure 3, Box 90 of FRENCH), so there is no need to recognize priorities. In contrast, forward-looking simulations attempt to properly model the real world, where some degree of conflict or dependence in trading strategies will typically exist. These situations cannot be accurately modeled by the system described in FRENCH.

In view of the foregoing examples, it is clear that the claims that remain in the application explicitly recite features that are neither described nor suggested in FRENCH, or in any of the prior art documents previously cited by the Examiner. Furthermore, it would be erroneous to suggest that it would be obvious to arrive at the claimed features, in the claimed combination, in view of FRENCH, taken alone or in combination with the other cited documents.

For example, it is erroneous to suggest that the claimed subject matter is obvious in view of FRENCH, MELNIKOFF and RUFFIN, if FRENCH is interpreted as not disclosing a simulation under possible future scenarios, as indicated at page 4 of the office action. RUFFIN merely states that one must "qualify [a] project prior to investing too much resource in an endeavour", and that generally, an ideal solution assessment process will entail a proof of concept undertaking to demonstrate the feasibility of the project (see col. 2 lines 10-19 of RUFFIN). Persons skilled in the art would clearly recognize that these general

statements provided in RUFFIN do not teach, in any detail, a system where simulations characterized herein as forward-looking are performed, or scenarios, rules, or any of the other features recited in the claims.

As a further example, FRENCH clearly teaches away from the Applicants' teachings with its system and method based solely on current market data and past performance. It would be erroneous to suggest that the Applicant's claimed system and method might be arrived at in an obvious manner, by somehow executing the Agents of FRENCH under possible future scenarios. This is not possible. FRENCH essentially implements a filter on historical data that can be applied without any knowledge of finance. Persons skilled in the art would understand that the Agents of FRENCH cannot be applied to a forward-looking simulation in a non-obvious way, as one would need to determine how the measures that FRENCH uses in its filters could be calculated in a theoretically and financially consistent way. For instance, FRENCH does not teach or suggest a system that can extract simulating pricing data from a database (see e.g. claims 4, 11, 18: "at least one risk value for each of one or more subsets of said simulated instruments... from a database") to achieve this. FRENCH allows historical data to be retrieved, but not data associated with forward-looking paths.

Moreover, as previously noted, FRENCH does not teach or suggest that its Agents may somehow be modified so that the Agents themselves can determine how much of an instrument to buy or sell based on various, dynamic, future time step dependent and scenario dependent criteria. For example, based on the teachings of FRENCH, it would be impossible for the person of ordinary skill in the art to arrive at a solution that models strategies such as: "Trade Option A to delta hedge my portfolio", "Trade Bond D to ensure a portfolio duration of 5" or "Liquidate some amount of Commodity G to ensure portfolio always has $5M in cash". In contrast, the claimed features of the Applicants' trade manager facilitate the modeling of such trading strategies in a risk management system

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where forward-looking simulations are performed. It is respectfully submitted that this example and others provided herein demonstrate that even if the Examiner were to erroneously conclude that all of the claimed features were disclosed in the prior art, the claimed combination is not merely a non-obvious arrangement of known elements.

For the foregoing reasons, it is respectfully submitted that claims 4, 11, and 18 are patentable over FRENCH and the other prior art references cited by the Examiner, and that the remaining dependent claims that remain in the application are also patentable for the same reasons. Withdrawal of the rejections under 35 U.S.C. 103(a) is respectfully requested.

For completeness, the Applicant notes that new claims 25, 27, and 29 are directed to a particular structure of a trade manager in a specific embodiment of the Applicant's system and method. In this embodiment, a trade manager comprises: a rule structure comprising at least one rule for a trading strategy; a tracking position list indicating at least one of tracked instruments and tracked positions; a tracking attribute list indicating one or more tracked quantities; a target vector indicating one or more desired trade results; a trade position list indicating at least one of tradable instruments and tradable positions; and a funding position list indicating instruments and positions that are tradable to fund the trading strategy. From the above discussion, it is clear that none of the prior art references cited by the Examiner teach or suggest this particular structure of a trade manager, for use in forward-looking simulations.

It would also be erroneous to suggest that this particular structure is obvious in view of the cited references. Consider, for example, that the trade manager provides a list of funding positions. Funding positions are those positions (e.g. instruments or cash) that must be purchased or sold, in whole or in part, to fund a trading strategy. FRENCH merely assumes that new Agents

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will be funded by selling the current underperforming Agents (see e.g. column 8, lines 20-25 of FRENCH). FRENCH does not teach that funding is portfolio-dependent (i.e. how much one buys of an investment could be a function of how much free cash the portfolio spins off from other investments). Accordingly, FRENCH cannot account for the natural growth of a portfolio and the spin-off effects of cash on trading strategies that would need to be funded. Instead, FRENCH assumes away the entire issue stating that an equivalent dollar value should be invested in all Agents (FRENCH, col. 5 lines 14-18) for the purposes of comparability, and that the dollar value of the investment should be based on some amount allowing for efficient trading (FRENCH, col. 4 lines 35-43). These simplifying assumptions are problematic in risk management applications. For instance, it may be the case that investments purchased by underperforming Agents may be very illiquid. Once cannot simply assume that these investments can be sold at their current price to fund new Agents. However, as noted at page 8 lines 3-9, and page 12 line 14 to page 13 line 12 of the Applicant's description, the structure of the Applicants' trade manager allows one to distinguish between liquid and illiquid investments. The co-operation of the claimed elements provides users with the ability to more accurately model liquidity considerations. This is a further example of a non-obvious advantage provided by the claimed combination of features.

Furthermore, the positions indicated in the funding position list may also be defined such that they are only available after a period of time has elapsed, as claimed in new claims 26, 28, and 30. This allows risks associated with settlement periods to be properly modeled, as discussed at p. 13 line 13 to p. 14 line 14 of the Applicants' description.
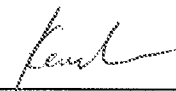
In view of the foregoing, it is respectfully submitted, therefore, that the present application is now in a position for allowance, and a Notice to that effect is earnestly solicited.

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Should any issues remain, the undersigned respectfully requests a personal interview or a telephonic interview with the Examiner to clarify the differences between the claims and the cited art. The Examiner is invited to contact the undersigned at (416) 364-7311 so that an interview may be scheduled at a time convenient to the Examiner.

Respectfully submitted,

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